PATENT SPECIFICATION 756,878

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COMPLETE SPECIFICATION.

Improvements in and relating to Fire Hose Nozzles.

We, MERRYWEATHER & SONS LIMITED, a British Company, of Greenwich High Road, London, S.E.10, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to fire hose nozzles.

Fire hoses are frequently provided with nozzles which can be adjusted to produce, at will, a spray or a concentrated jet. On entering a burning building, the fireman sets the nozzle to produce a spray of the widest possible angle so as to clear the smoke in front of him. He then gradually narrows the angle of the spray until a jet is produced which he can usefully direct on to the seat of the conflagration.

To enable him so to adjust the jet, the nozzle is provided with a cone pointing backwards, which can be adjusted along the axis of the nozzle so as to vary the width of the annular space through which the water issues. As the width of the annular space is decreased, the angle of the spray decreases until a solid jet is produced.

For both protective and fire extinction purposes, a finely divided spray is usually more effective than a coarse spray and leads to an economy of water, but the cone device will produce only a hollow coarse spray. The usual method of producing an evenly distributed, finely divided spray is to use a nozzle of the "impinging jet" type, i.e. a nozzle constructed so as to produce jets that inpinge upon one another and break each other up. The cone regulating device cannot be used in conjunction with such nozzles.

The invention is concerned with the production at will of an evenly distributed, finely divided spray with adjustment of the angle of the spray or a concentrated jet.

The nozzle in accordance with the invention is of the "impinging jet" type capable of producing a wide angled, finely divided spray such as is desirable for protective and fire extinction purposes, and is provided with a regulating device in the form of a sleeve which can be adjusted axially along the barrel of the nozzle and into the path of that spray. When the sleeve lies clear of the spray, the spray is projected at a wide angle and in a finely divided condition. When it is moved into the path of the spray, the angle of the spray is reduced. By increasing the amount by which the sleeve projects forward from the delivery end of the nozzle, the angle of the spray can be gradually reduced and the spray made gradually more concentrated until a substantially solid jet is produced.

The sleeve should be so formed or arranged that air can be drawn through it. This is preferably contrived by arranging a generous air space between it and the body of the nozzle.

For adjustment of the sleeve, the barrel of the nozzle can be provided with a quick-pitch helical groove and the sleeve with a pin which engages in the groove. The sleeve can then be adjusted by a simple turning movement.

The provision of the regulating sleeve does not complicate the provision of means for shutting off the nozzle. For example, the barrel of the nozzle can be screw-threaded on a central tube so that it and the sleeve can be moved together or independently of each other, backward axial movement of the barrel resulting in a complete closing of the water passage.

An example of a nozzle in accordance with the invention will now be described in more detail with reference to the accompanying drawings in which :—

Figure 1 is a longitudinal section ; and

Figure 2 is a section taken on the line II—II of Figure 1.

The nozzle comprises a barrel 1 which is screw-threaded onto a central tubular piece

2 which terminates in a branch pipe connector 3. At the delivery end, the barrel is fitted with a nozzle proper 4 which has a pair of rings of jet holes 5 and 6. The holes 5 in one ring are parallel to the axis of the nozzle and the holes 6 in the other ring are approximately at 45° thereto so that the jets which issue from the holes collide and thus give rise to the production of a wide-angled fine spray. The angle between the holes 5 and 6 may be varied and may if desired be nearly 90°. Within the nozzle 4 is mounted a disc 7 having a ring of holes 8 surrounding a central portion fitted with a leather washer 9 which, when the nozzle is shut off, is pushed against a seating 10 on the end of the central tubular piece 2. By screwing the barrel 1 forward the disc 7 is moved away from the seating 10 so that water can be delivered through the holes 8 to the jet holes.

The nozzle barrel 1 is provided with a helical groove or quick-pitch screw thread 11 and is surrounded by a sleeve 12 having a pin 13 which projects into the groove 11 so that, by being turned, the sleeve 12 can be so displaced along the barrel as to bring its forward extremity to the forward position shown by broken lines in Figure 1.

In the most retracted position, the rear end of the sleeve 12 abuts against a shoulder 14 on the barrel 1. Its front end surrounds the body of the nozzle 4 but lies behind the spray jets. In front of the shoulder, the sleeve 12 is provided over a short distance with internal axial ribs 15, and the body of the nozzle 4 is provided with external ribs 16. The sleeve 12 is a good running fit on the ribs 16 and the barrel 1 fits similarly within the ribs 15, so that the sleeve is well supported while a generous air space is provided between the sleeve and the barrel. By being turned on the barrel, the sleeve can be advanced so that it projects into the path of the finely divided spray issuing from the nozzle 4.

The character of the discharge from the nozzle varies with the position of the sleeve 12. When the sleeve is in the retracted position shown in full lines in the drawing, the nozzle delivers a wide-angled finely divided spray. As it is advanced from that position towards the position shown by broken lines in Figure 1, it progressively cuts down the angle of the spray and concentrates the spray until the discharge is in the form of a substantially solid jet.

Whatever may be the disposition of the regulating sleeve on the barrel, i.e. whether the nozzle is producing a spray or a jet, the water supply can be cut off by screwing back the barrel 1 so as to cause the disc 7 to close against the seating 10.

The arrangement of jet holes in the nozzle which has been described above has given very good results but other arrangements are possible. For example, there may be two pairs of rings of jet holes, the holes in the second pair being disposed nearer to the axis, than those in the first pair.

The part shown at 17 is a filter, and 18 indicates a sealing device forming a water-tight joint between the relatively rotatable parts 1 and 2. The parts 19 and 20 are two external rubber rings one of which is mounted on the barrel 1, whereas the other is mounted on the sleeve 12. These rubber rings act as protectors and give a comfortable grip when the device is being used but otherwise do not effect the operation of the device.

Any suitable means may be provided for holding the sleeve 12 in adjusted position on the barrel. A convenient means for doing this is a set of say, three rubber friction plugs such as the one shown at 21 in Figure 1, set at positions spaced round the barrel.

What we claim is :—

1. A fire hose nozzle of the impinging jet type capable of producing a wide angled finely divided spray, wherein a regulating device is provided in the form of a sleeve which can be adjusted axially along the barrel of the nozzle and into the path of the spray to reduce the angle of the spray when required and if desired to convert it into a substantially solid jet.

2. A fire hose nozzle as claimed in Claim 1 wherein the barrel of the nozzle is provided with a quick-pitch helical groove and the sleeve with a pin which engages the groove to enable the sleeve to be adjusted by a turning movement.

3. A fire hose nozzle substantially as herein described with reference to the accompanying drawing.

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PROVISIONAL SPECIFICATION.

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Fire hoses are frequently provided with nozzles which can be adjusted to produce, at will, a spray or a concentrated jet. On entering a burning building, the fireman sets

the nozzle to produce a spray of the widest possible angle so as to clear the smoke in front of him. He then gradually narrows the angle of the spray until a jet is produced which he can usefully direct on to the seat of the conflagration.

To enable him so to adjust the jet, the nozzle is provided with a cone pointing backwards, which can be adjusted along the axis of the nozzle so as to vary the width of the annular space through which the water issues. As the width of the annular space is decreased, the angle of the spray decreases until a solid jet is produced. Further reduction of the width of the annular space causes the size of the solid jet to be decreased.

For both protective and fire extinction purposes, a finely divided spray is usually more effective than a coarse spray and leads to an economy of water, but the cone device will produce only a hollow coarse spray. The usual method of producing an evenly distributed, finely divided spray is to cause a number of small jets to impinge and break each other up and the cone regulating device cannot be used in conjunction with impinging jet nozzles.

The invention is concerned with the production at will of an evenly distributed, finely divided spray with adjustment of the angle of the spray or a concentrated jet.

The nozzle in accordance with the invention is of the impinging jet type capable of producing a wide angled, finely divided spray such as is desirable for protective and fire extinction purposes and is provided with a regulating device in the form of a sleeve which can be adjusted axially along the barrel of the nozzle so as to lie clear of the issuing spray or in the path of that spray. When the sleeve lies clear of the spray, the spray is projected at a wide angle and in a finely divided condition. When it is moved into the path of the spray, the angle of the spray is reduced. By increasing the amount by which the sleeve projects forward from the delivery end of the nozzle, the angle of the spray can be gradually reduced and the spray made gradually more concentrated until a substantially solid jet is produced.

The sleeve should be so formed or arranged that air can be drawn through it. This is preferably contrived by arranging a generous air space between it and the body of the nozzle.

For adjustment of the sleeve, the barrel of the nozzle can be provided with a quick-pitch helical groove and the sleeve with a pin which engages in the groove. The sleeve can then be adjusted by a simple turning movement.

The provision of the regulating sleeve does not complicate the provision of means for shutting off the nozzle. For example, the barrel of the nozzle can be screw-threaded on a central tube so that it and the sleeve can be moved together or independently of each other, backward axial movement of the barrel resulting in a complete closing of the water passage.

An example of a nozzle in accordance with the invention will now be described in some detail.

The nozzle comprises a barrel which is screw-threaded on to a central tubular piece which terminates in a branch pipe connection. At the delivery end, the barrel is fitted with the nozzle proper which has a pair of rings of jet holes. The holes in one ring are coaxial with the nozzle and those in the other ring are approximately at right angles thereto so that the jets which issue through the holes collide and thus give rise to the production of a wide-angled fine spray. Within the nozzle proper is mounted a disc having a ring of holes surrounding a central portion which, when the nozzle is shut off, is pressed against a seating on the end of the central tube. By screwing the barrel forward, the disc is moved away from the seating so that water can be delivered through the holes in the disc to the impinging jets.

The nozzle barrel is provided with a helical groove or quick-pitch screw thread and is surrounded by a sleeve having a pin which projects into the groove so that, by being turned, the sleeve can be displaced along the barrel.

In the most retracted position, the rear end of the sleeve abuts against a shoulder on the barrel. Its front end surrounds the body of the nozzle proper but lies behind the spray jets. In front of the shoulder, the barrel is provided over a short distance with axial ribs and the body of the nozzle proper is provided with a different number of similar ribs. The sleeve is a good running fit on the ribs so that it is well supported while a generous air space is provided between the sleeve and the barrel. By being turned on the barrel, the sleeve can be advanced so that it projects into the path of the finely divided spray issuing from the nozzle.

The character of the discharge from the nozzle varies with the position of the sleeve. When the sleeve is in the retracted position, the nozzle delivers a wide-angled finely divided spray. As it is advanced from that position, it progressively cuts down the angle of the spray and concentrates the spray until the discharge is in the form of a substantially solid jet.

Whatever may be the disposition of the regulating sleeve on the barrel, i.e., whether the nozzle is producing a spray or a jet, the water supply can be cut off by screwing back the barrel.

The arrangement of jet holes in the nozzle which has been described above has given

very good results but other arrangements are possible. For example, there may be two pairs of rings of jet holes, the holes in the second pair being disposed nearer to the axis than those in the first pair and so as to produce colliding or impinging jets which form a relatively wide-angled fine spray. The axes of the holes in the two rings of a pair need not of necessity be at right angles to each other. They can have any relative disposition which will produce a wide-angled fine spray.

The arrangement described above thus provides for the production of a finely divided spray which can be projected at widely differing angles and which can be converted into a concentrated jet and also provides for shutting off the water supply when desired whatever the setting of the nozzle may be.

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756,878 COMPLETE SPECIFICATION
1 SHEET
This drawing is a reproduction of the Original on a reduced scale.

Fig. 1.

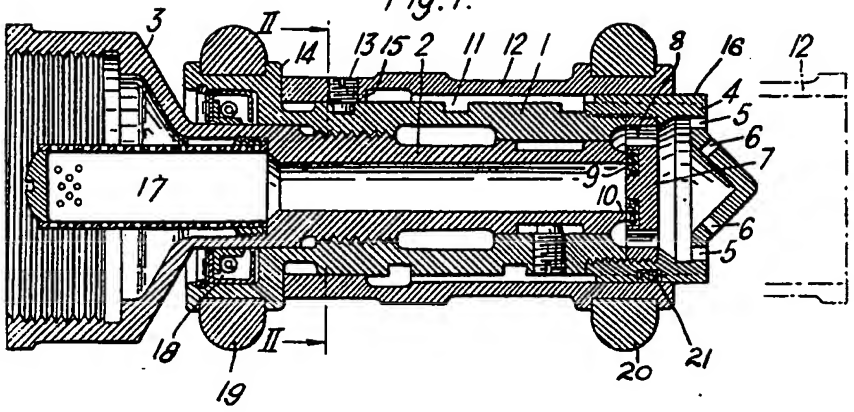

Fig. 2.